Bellingham Square Project

2021/2022 STEM Cohort

La Colaborativa

Get to know about us!!

Who are we?

- We are youth Interns at La Colaborativa ranging from the ages of 14-18. We are all apart of the STEM internship program.

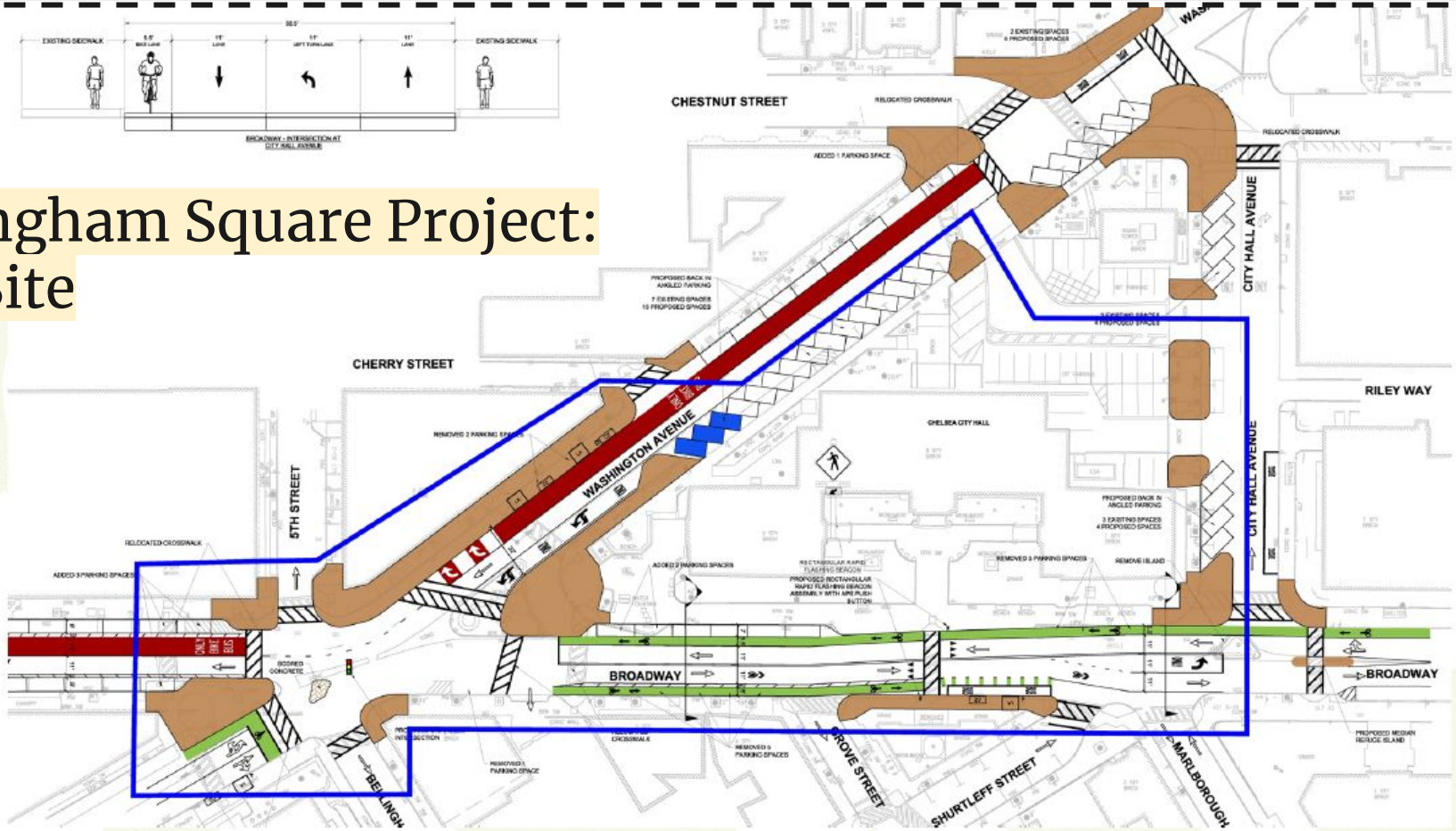
What is our focus in the STEM Internship?

- Our focus is to find and come up with solutions to issues in our communities using Science, Tech, Engineering, and Math.

Meet the Teams

Overview and History	Johanna Castillo Mejia Angie Quiroz Samuel Villanueva
Who Lives Here? (Population)	Alan Mendoza Roxana López
Businesses	Daniela Perez Carlos Alfaro
Transportation and Roads	Jimmy Merino Gizelle Rodriguez Duane Davis
Environment and Safety	Kenia Ralda Justin Reyes Aya Hoda Faiz

Bellingham Square Project: The Site

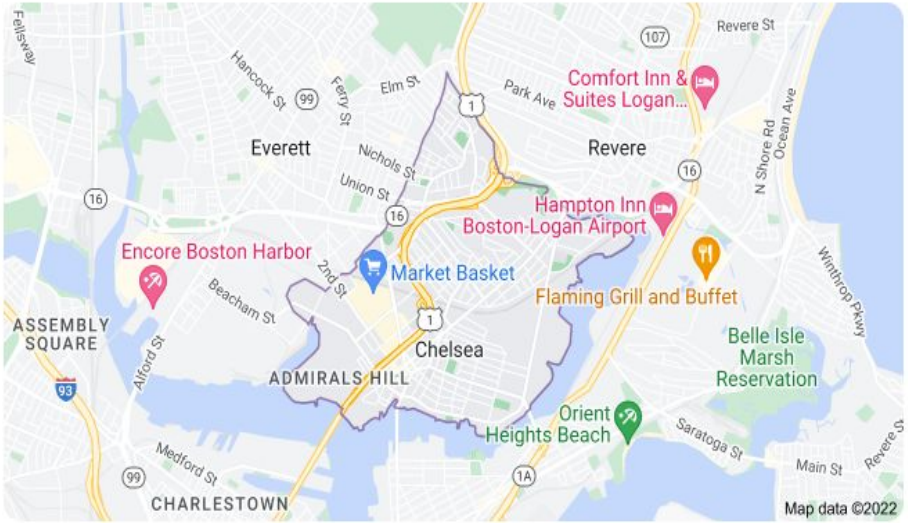


Bellingham Square Project: Intern Involvement

The STEM Interns of La Collaborative will:

1. Become familiar with the site through research and site visit(s).
2. Attend Project Kick-off Meeting
3. Gather voices from the community through Public Engagement Process (surveys, interviews, listening sessions)
4. Present our findings to the Design Team and the City (and others?)
5. Share our own ideas and recommendations that we have gathered from our experience

Introduction To The City Of Chelsea



Located in the center of Chelsea, a small city just north of Boston, Bellingham Square is a district composed primarily of civic and commercial buildings. It is centered on the six-way junction of Broadway, Washington Avenue, Bellingham Street, Hawthorne Street, and 5th Street. It is roughly bounded by Broadway, Shawmut, Chestnut, and Shurtleff. This area makes up 30 acres of Chelsea.

City By The Numbers

Average rent: Roughly $2,300

Cost of Living: 44% higher than the national average

Median household income: $56,000

Median age: 33.3

City population: About 40,787 people

- *67%* of the population is Hispanic
- *45.5%* of residents are foreign-born
- *68.9%* of the population are US citizens

Brief Overview

Chelsea was settled in 1624 and annexed to Boston in 1635. In 1739, the town of Chelsea was incorporated, growth increased rapidly due to its improved accessibility. By 1857 the population reached 12,000 and Chelsea was chartered as a city. The rapid expansion of industries and the enormous population increase resulting from the influx of immigrant workers changed the character of the city in the late 19th century from a residential community to an urban one.

The major historical event that altered the nature of the (now) Bellingham Square Area was the Great Fire, which began on Palm Sunday, April 12, 1908 and razed nearly 3,000 structures on 500 acres of land in the center of the city. Prime commercial property near the geographic heart of the city was now available for new construction and rapidly became the the civic and commercial heart of chelsea once again, this district being Bellingham Square.

The results of the rapid redevelopment following the 1908 Fire include all of Chelsea's major public buildings, the multiple-story commercial buildings on Broadway between Chelsea Square and Bellingham Square, and the residential bow fronts and larger multiple-story apartment blocks on surrounding streets.

The Chelsea Public Library

The building of the Chelsea Public Library drew national attention to the small city. The new Library, designed by Guy Lowell, was made possible through the generous gift of nationally known benefactor Andrew Carnegie.

DeDomenico Buildings

The cohesiveness of Bellingham Square is particularly enhanced by the DeDomenico Buildings at 466-472 and 478 Broadway. Salvador DeDomenico, owner of the DeDomenico Building, 466 Broadway, and the S. DeDomenico Building, 478 Broadway, used the same architect, Daniel Woodbury, and builder, the Guidera Construction Co., to construct both of these large three-story corner buildings in 1908.

The Soldiers & Sailors Monument

Consists-of a granite base and column topped with a bronze statue. It is the only complete structure predating the 1908 Fire. The monument, a Civil War memorial, was located in Union Park from 1869 to 1911, when it was moved to its present location in front of City Hall.

Saint Rose

The Saint Rose catholic church was the only building in the district to partially survive the fire. The 1869 design by Patrick Keeley was reworked in 1908 by Edward J. P. Graham. He replaced a lancet window over the central entryway with a rosette window.

City Hall

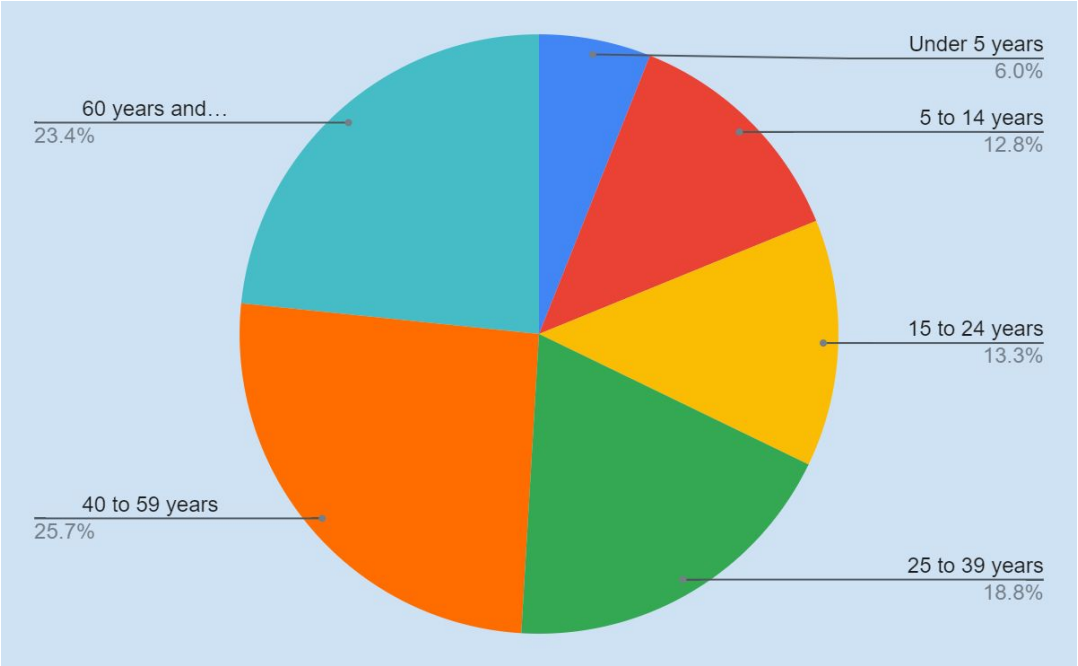
The placement of prominent public buildings forming the center and periphery of Bellingham Square was important in the reestablishment of the public's image of the new civic and commercial center. The well-known architectural firm of Peabody and Stearns designed City Hall, recalling Independence Hall in design and creating an important civic focal point for the citizens of the city. The choice of Peabody and Stearns as architects for the City Hall was particularly significant , since the quality of the City Hall' s design set the tone for subsequent building in the district .

TIMELINE

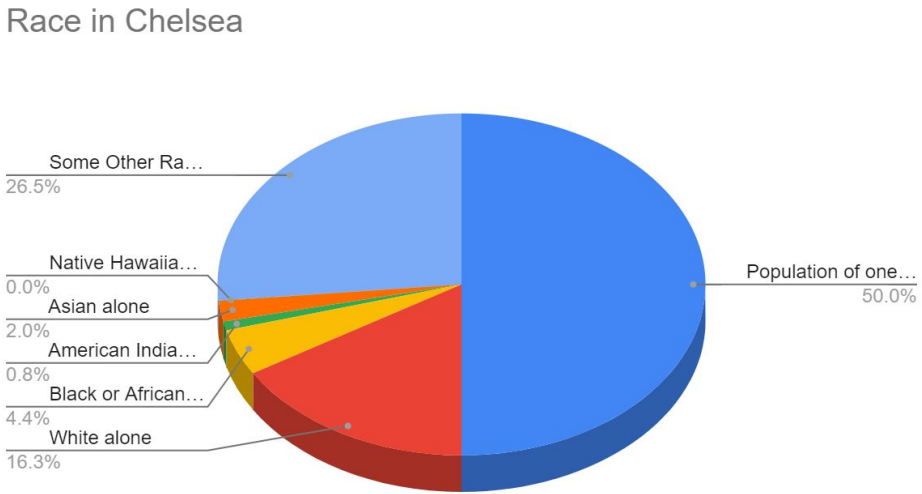
Demographics (who lives here?)

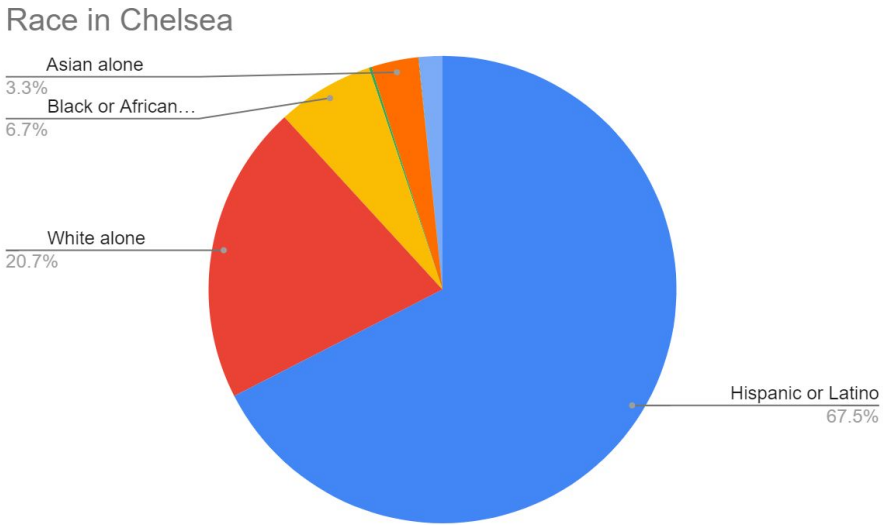
Who Lives Here? (Population)

-AGE



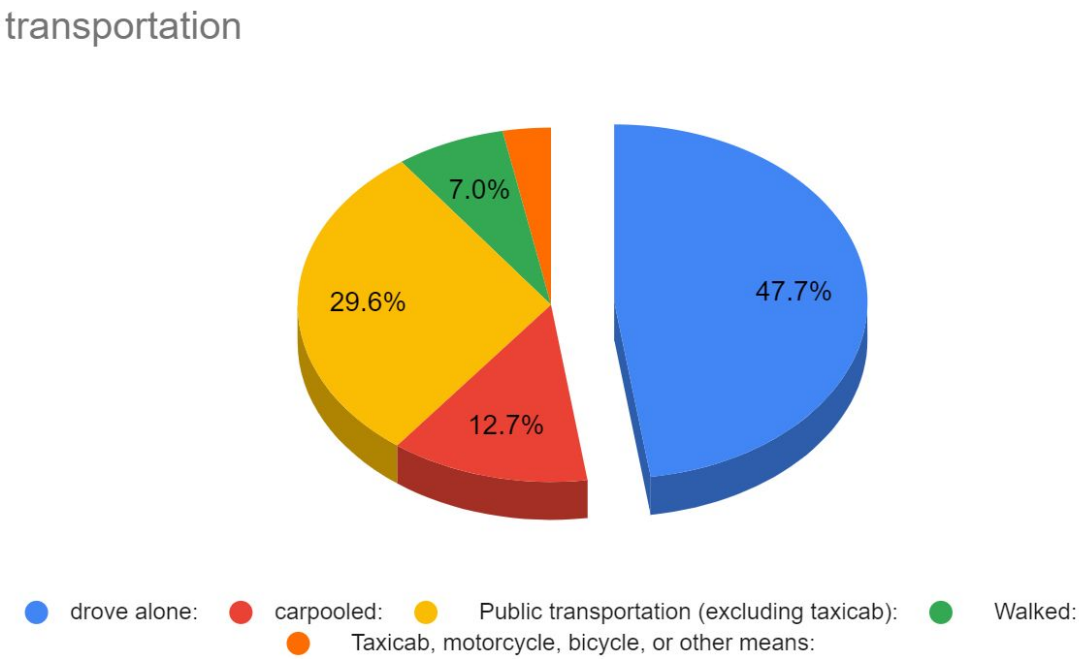
Who Lives Here? (Population)
-Race



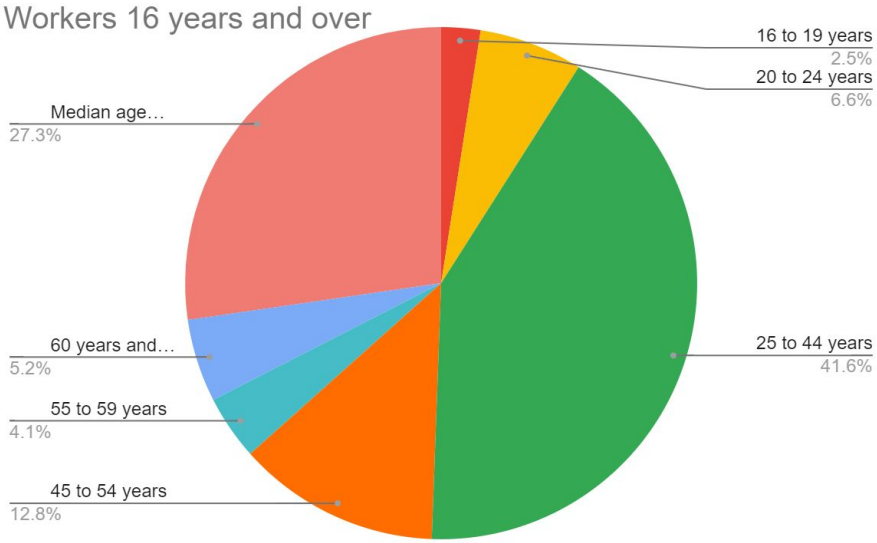


Who Lives Here? (Population)

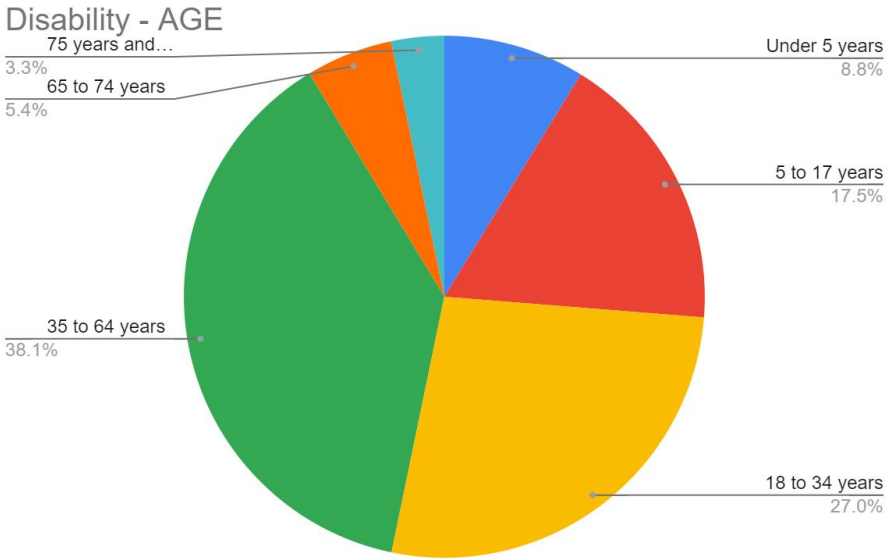
-transportation

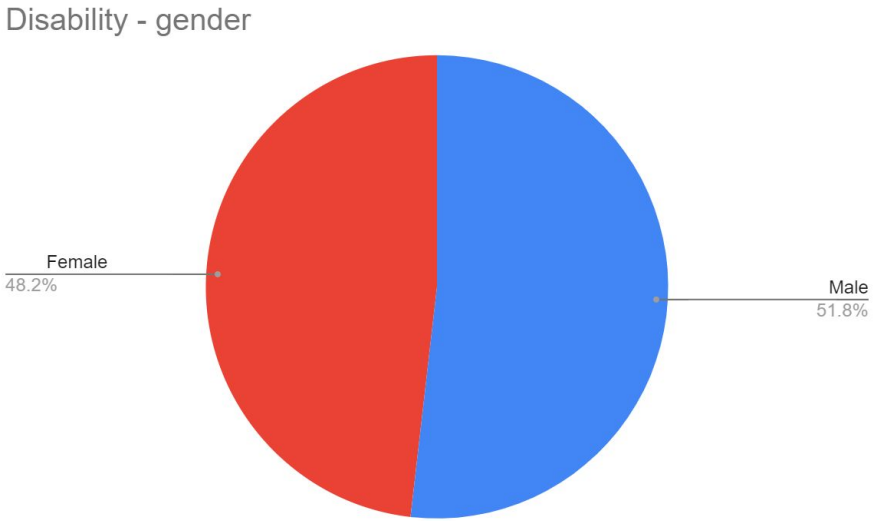


Who Lives Here? (Population)-
Workers **&** earnings



Who Lives Here? (Population)- Disabilities

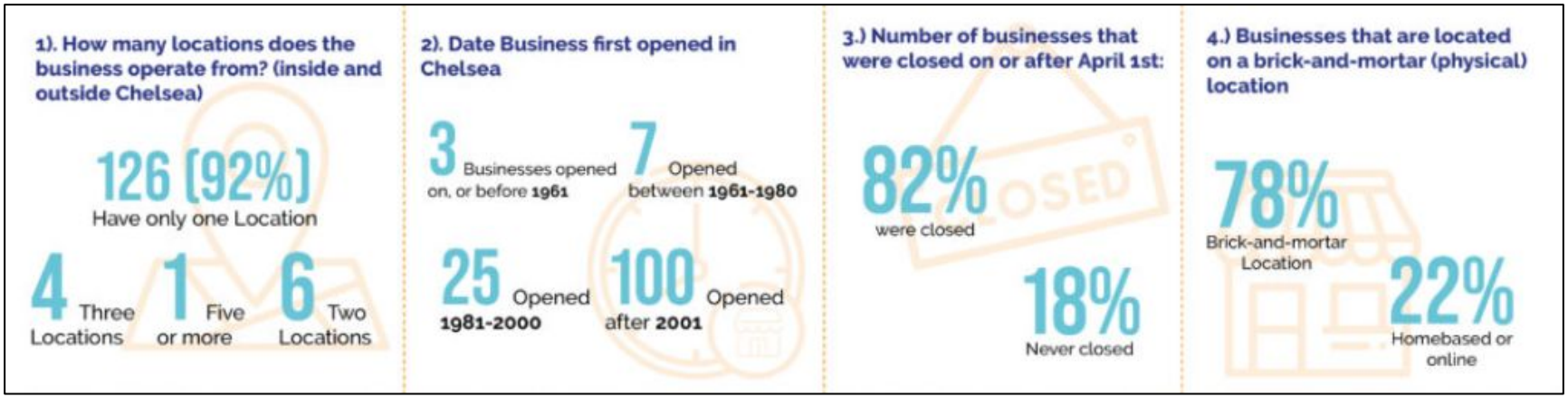




Businesses in Bellingham Square

Business Information In Chelsea

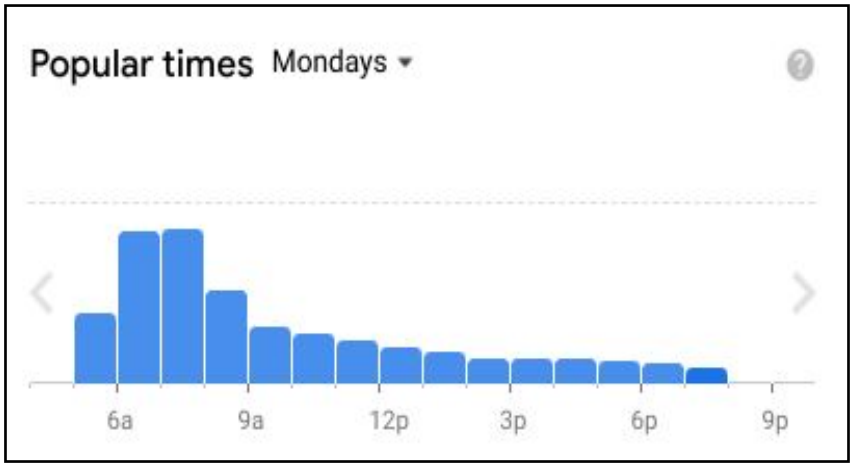
The number of businesses in Chelsea, as well as the number of businesses in Bellingham Square, has increased throughout time. Despite the fact that the number of businesses has expanded over time, covid has had an impact on that growth. Many stores have been forced to close as a result of Covid's influence on the industry. Here's some information on Chelsea businesses.
https://chelseabusinessfoundation.org/about-us/



Dunkin Donuts

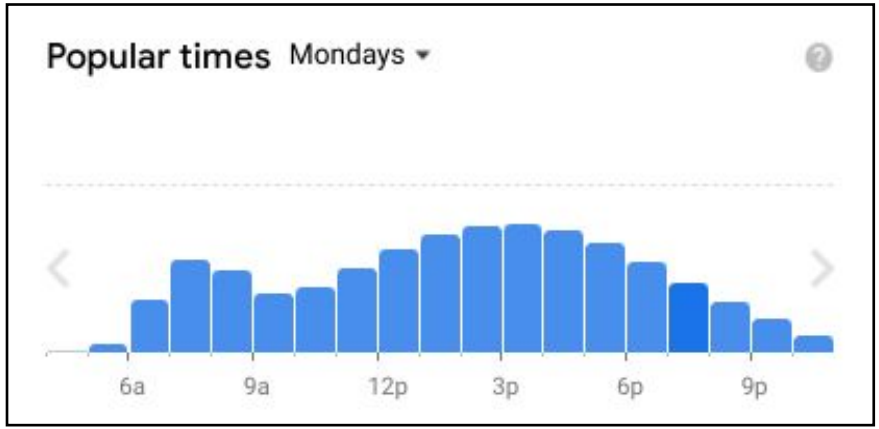
Dunkin Donuts is located at 12 Washington Avenue, near the bus stop "Washington Ave @ Broadway," and is busiest in the morning from 6 to 9. Dunkin Donuts is open from 5am to 8pm and has an excellent reputation for delivery and takeaway.

Dunkin' More information on the location can be found at this link. For instance, how busy it is and which days are busiest.

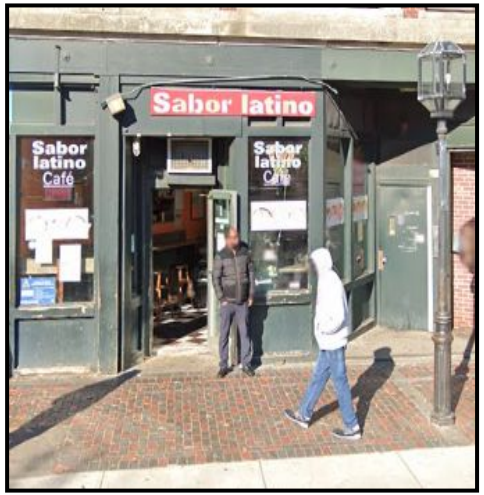


McDonald’s

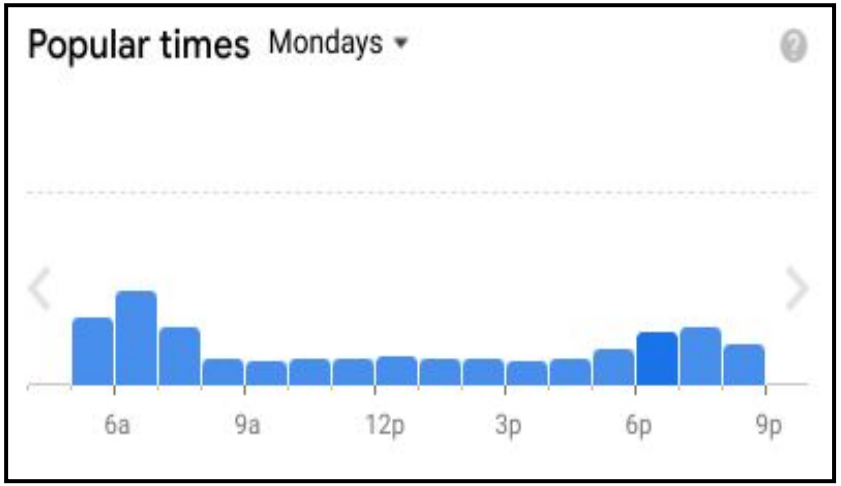
McDonald's , located at 472 Broadway, is another well-known business in Bellingham Square. On weekdays, the busiest times are from 6 to 9 a.m. and about 3 p.m. McDonald's offers a variety of services, including dine-in and delivery; however, there is no drive-thru and parking is limited. It's always very crowded, especially during the school year, because it's so close to the middle school.



Sabor Latino



Sabor Latino: It's a modest business at 2 Washington Avenue, near McDonald's. Because it is a modest shop compared to other businesses in Chelsea and Bellingham Square, it isn't extremely busy. According to Google Maps, Sabor Latino is a tiny Colombian restaurant. Parking is limited, as it is at McDonald's and Dunkin' Donuts, but it is adjacent to the school, which may draw students as well as other Chelsea residents.

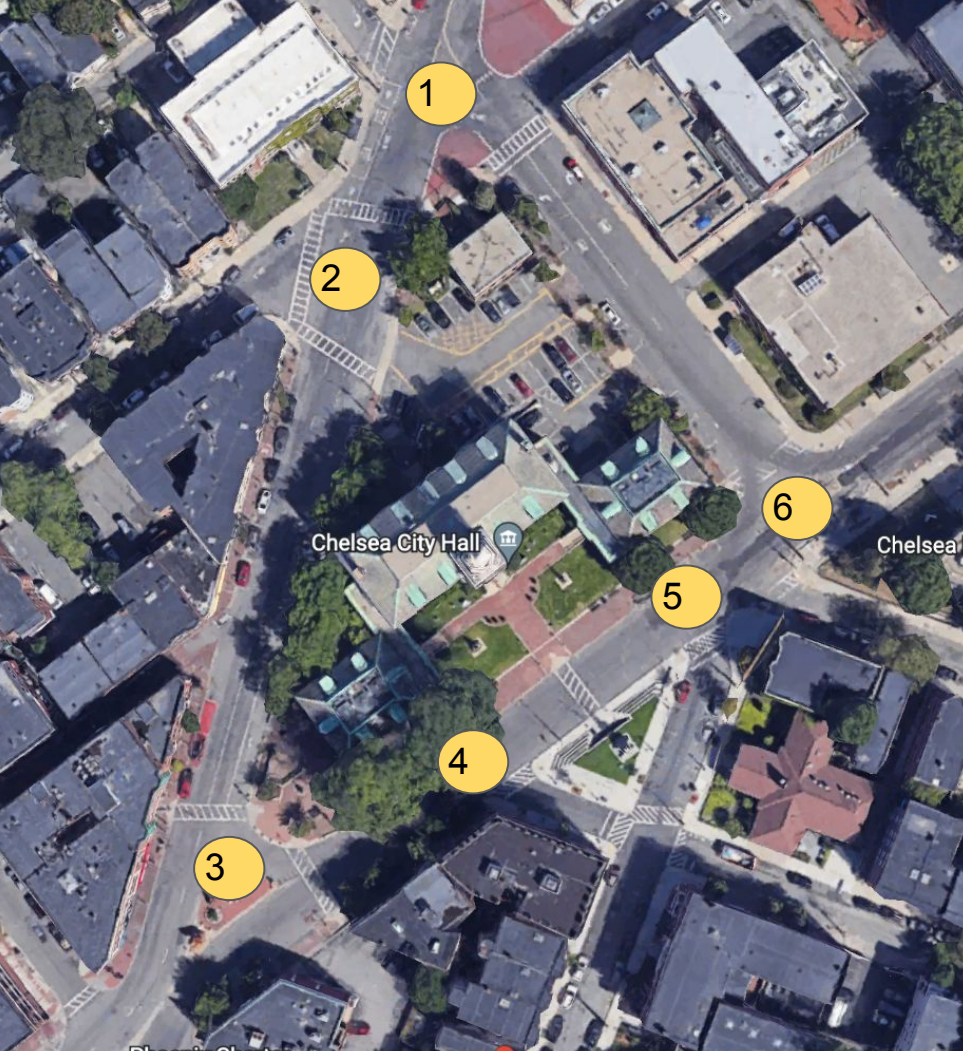


Why we chose these businesses

- Our goal is to select businesses that reflect the entire Bellingham Square area.
- McDonald's and Dunkin' Donuts were chosen because they are two of the most popular and busiest companies in Bellingham Square. This portrays Bellingham Square because it is an extremely bustling location that is frequently congested.
- We chose Sabor Latino because Bellingham Square also features a number of smaller companies that represent Chelsea, and many of those little businesses are restaurants, which are largely run by Latinos.

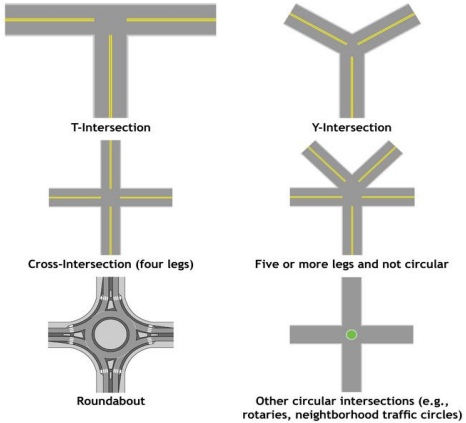
Transportation & Roads

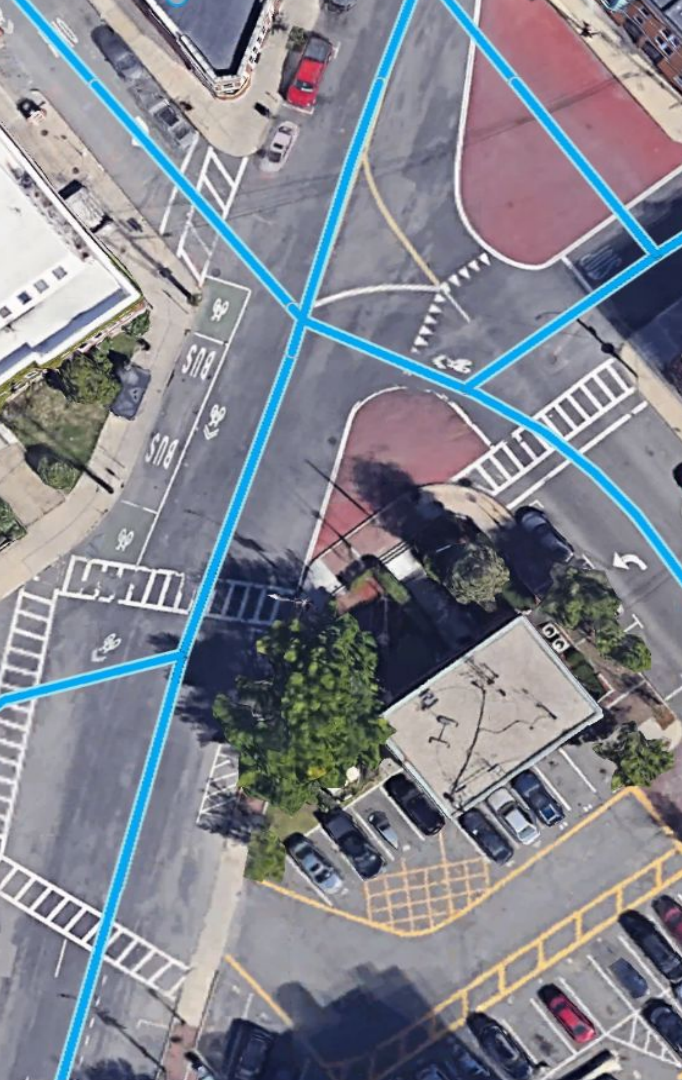
Gizelle Rodriguez, Jimmy Merino, & Duane Davis



Roads

- 1 five legged Intersection (1)
- 3 T-Intersections (2)(4)(5)
- 1 Y-Intersection (3)
- 1 Cross-Intersections (6)





Bike Paths

Newly added bike path. There is only one bike path along Washington Ave northwest of city hall. This does not extend around Bellingham square. Leaving bike riders without any protection.

From the **New York Times** it indicates that, **"**According to a new study the finding adds to a growing body of research indicating that investments in cycling infrastructure can encourage more people to commute by bike, which helps reduce greenhouse gas emissions and improve health.

Therefore, it is important that we push for modified bike paths.

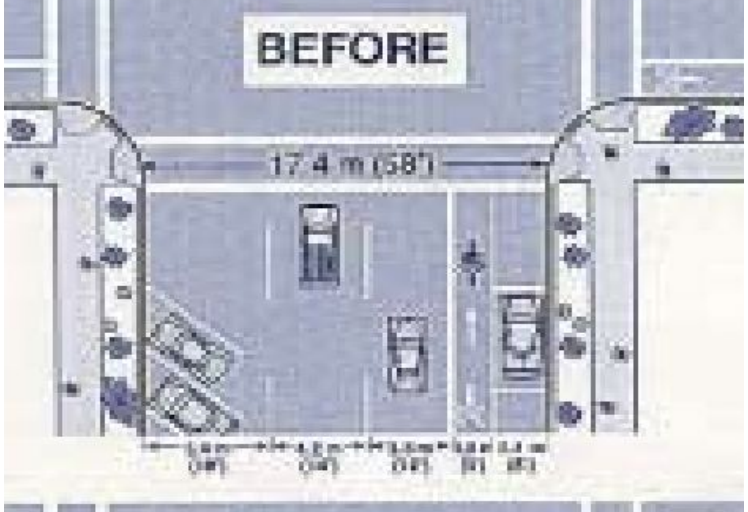
Proposal: More bike paths should be implemented as this can encourage people to use less cars, causing less traffic build up, & decreasing Chelsea's air pollution. It also guarantees more safety for bikers.

Crosswalks

There are 8 crosswalks surrounding Bellingham Square.

Crosswalks are implemented to facilitate a safe pedestrian cross by giving 2 designated points to do so.

50% of crosswalks have a sufficient paint job while 50% of crosswalks are weathered away. (2-3-4-8)

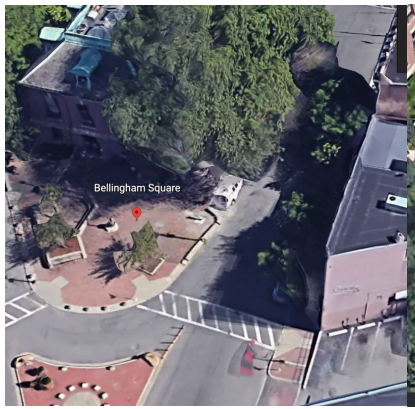


A great crosswalk has...

- **Two points in which the crosswalk is extended**
- **Extended curve bulbs**

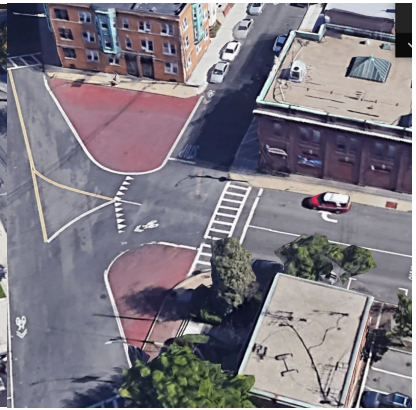
From The US Department of Transportation and Federal Highway Administration it states, "It should also be noted that crosswalk maintenance should include the actual **street surface**, and not simply the pavement markings. Although crosswalks are a part of the roadway, they require a **higher level of maintenance than surrounding roadway because pedestrians are less tolerant of defects than motorists"**. Minor potholes and such may not be a large hazard for motorists but can be a huge threat to pedestrians.
Read more at US Department of Transportation

Bellingham Square Crosswalks



1

2



3

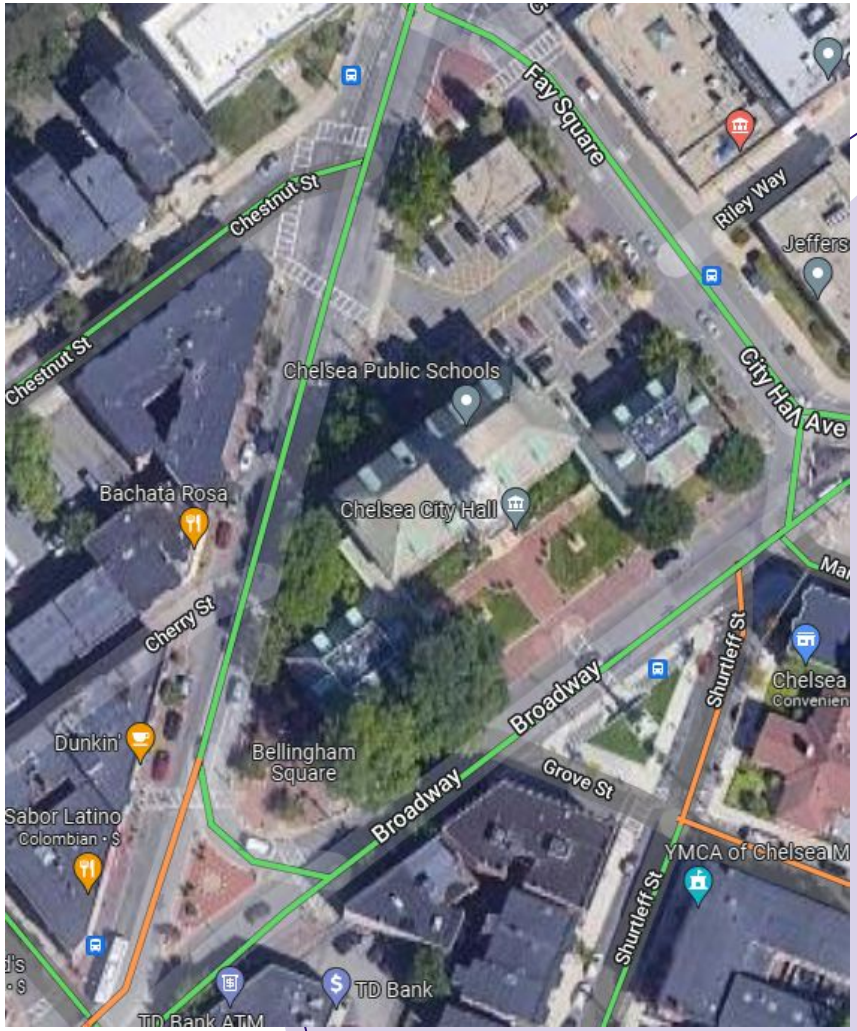
Things we want to keep

There are 8 crosswalks along bellingham square that are efficient, many of them are short due to the small land mass. This decreases the chances of pedestrians getting hit.

1) **Crosswalk with an extended curve bulb.**
2) **Short crosswalk that does not need a bulb.**
3) **Cross walks with 2 extended bulbs and a bike path intersecting.**

Proposal: Google Earth image depicts clearly seen crosswalks, however in real life right now, they are weathering away. This is because of the constant usage and weather patterns over time. Our proposition is that Sidewalks should get a fresh paint job every few months to ensure the safety of our residents. In addition, to street surface checks because they affect the pedestrians.

The general idea of the project was to find out the traffic patterns within Bellingham Square. With the shown interest, myself & other colleagues working on the Transportation & Roads, have analyzed the traffic patterns within the square.



Traffic Patterns

Utilizing Google Maps traffic flow, data has been collected using the six streets within the Bellingham Sq. Project's jurisdiction. For every color of the street, a tally has been marked to then find the overall average of the traffic flow for the set of hours on a specified day.

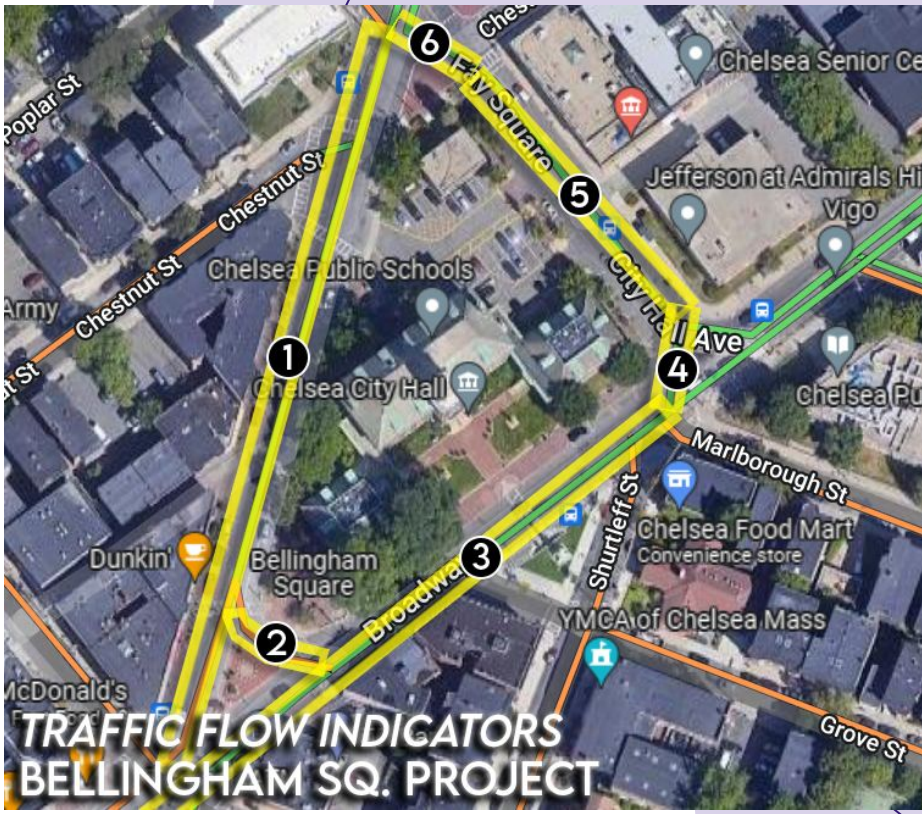
A key can be found to the right to portray what each color means on the streets located in Google Maps.

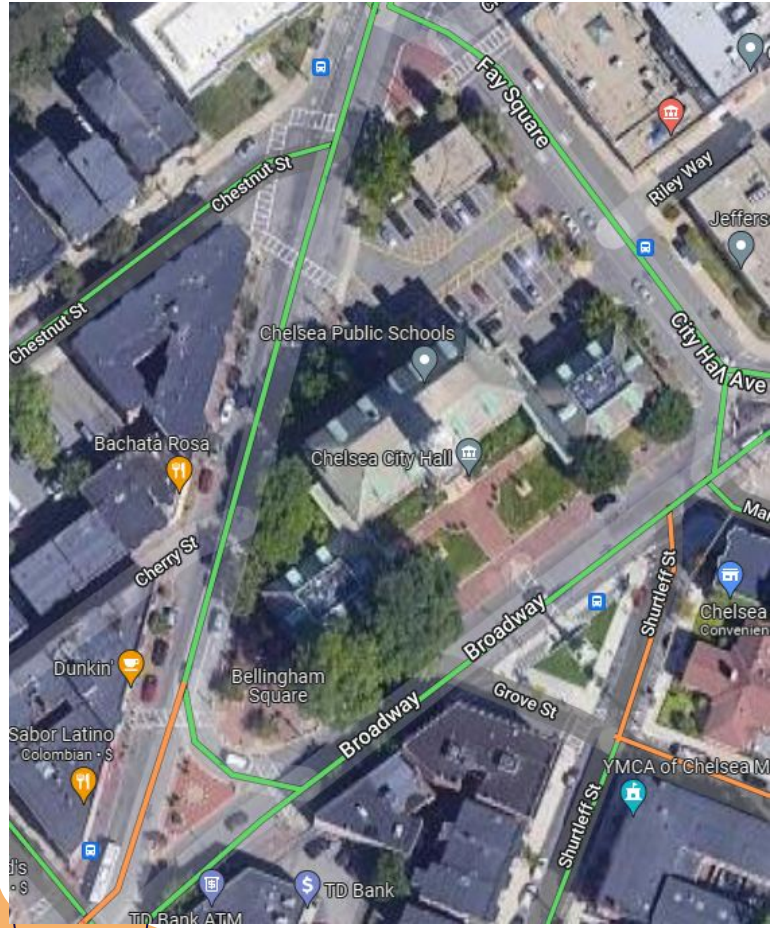
Understanding The Key

- Green represents little to no traffic.
- Orange represents little traffic.
- Light Red represents heavy traffic.
- Dark Red represents severe/extreme traffic.
- All these shades of colors will be on all graphs to determine the flow of traffic.

Defining The Streets

A couple of streets & other traffic flow routes in Bellingham Square had been sampled to overall determine that average traffic flow between a set of hours (morning or afternoon of the specified day).



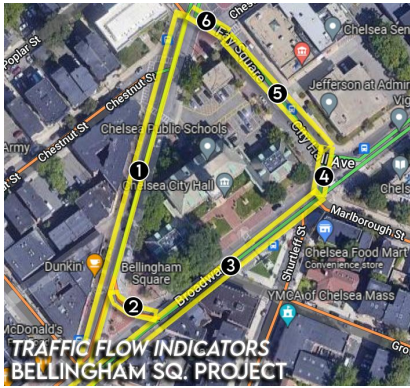


Methodology

In every set of hours, whether it be in the morning or afternoon, a total of 5 hours of data per set has been recorded. With such, we are looking at six different colors per hour, meaning you would get 6 pieces of information; traffic flow in that specified road within that hour. After, you'd move onto the next hour, record data, and so forward. In total, you should have 30 pieces of information, 5 per every hour on that road, 6 total roads.

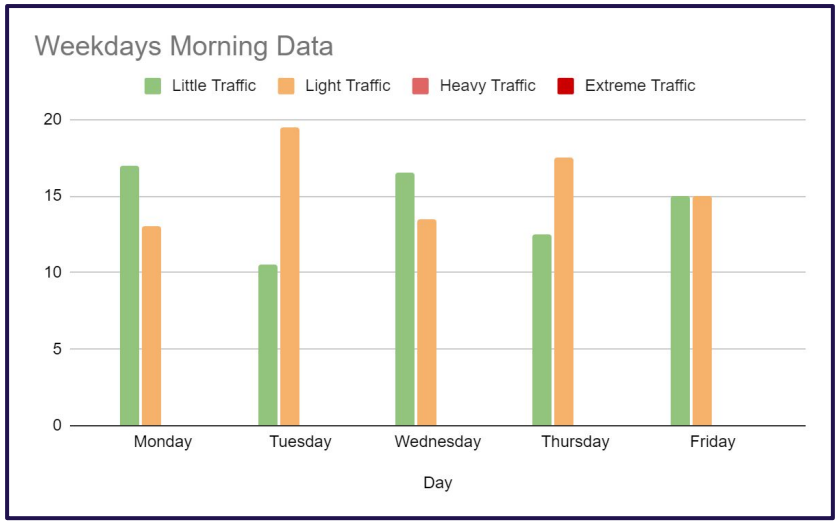
I looked at morning (6:00 AM to 10:00 AM) and evening rush hours (3:00 PM to 7:00 PM).

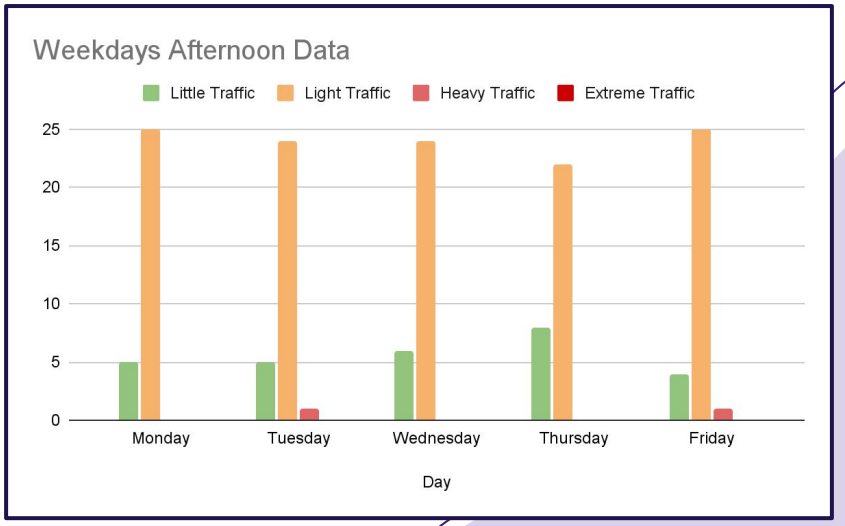
Data Link



Bellingham Sq.

Weekday Traffic Flows



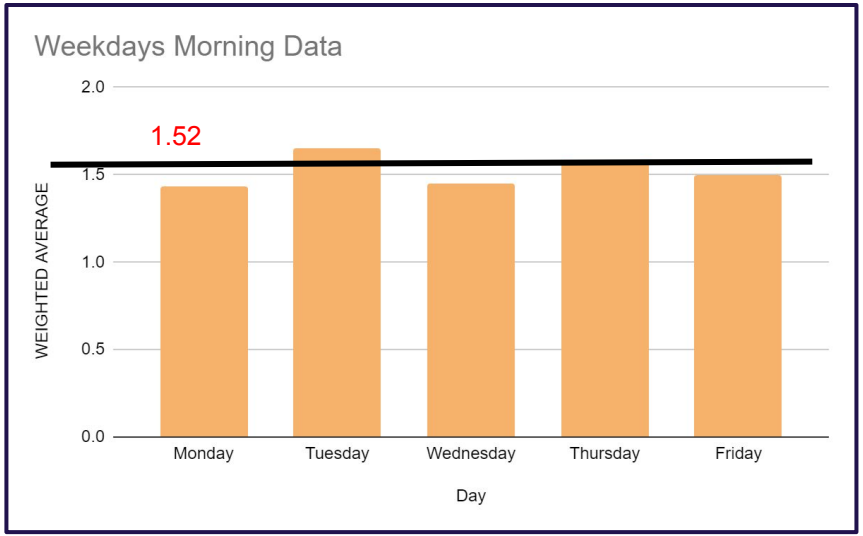


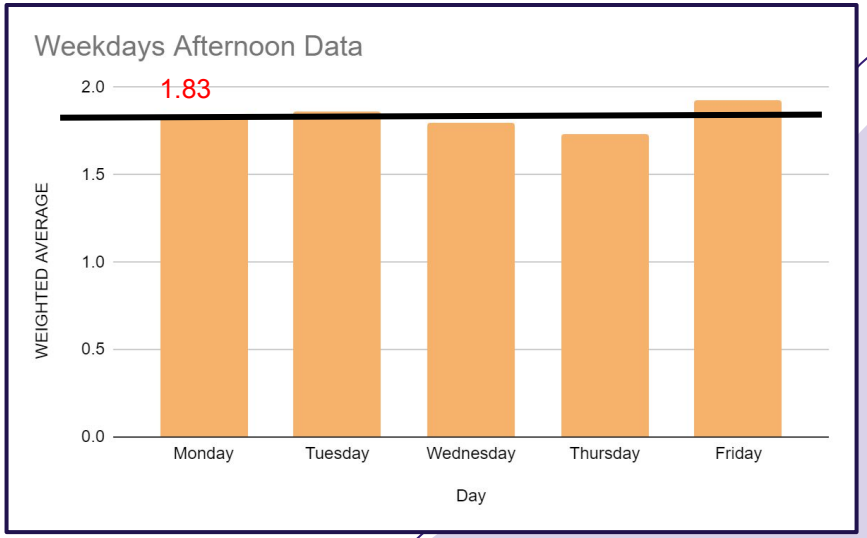
Between the hours of 6:00 AM to 10:00 AM...

- On Mondays, there tends to be more little traffic, than light traffic on roads reported.
- On Tuesdays, there tends to be more light traffic than little traffic on roads reported.
- On Wednesdays, there tends to be little traffic than light traffic on roads reported.
- On Thursdays, there tends to be more light traffic than little on roads reported
- On Fridays, there tends to be the same amount of traffic between little and light on roads reported.
- There is no heavy or extreme traffic flows on weekday mornings oo roads reported.

Between the hours of 3:00 PM to 7:00 PM...

- Between the days of Monday, Wednesday, & Thursday, there tends to be more light traffic, than little traffic on roads reported.
- On Tuesday & Friday, there tends to be higher light traffic, 5 roads reports to have little traffic throughout the day, & a road having heavy traffic on roads reported.





Between the hours of 6:00 AM to 10:00 AM...

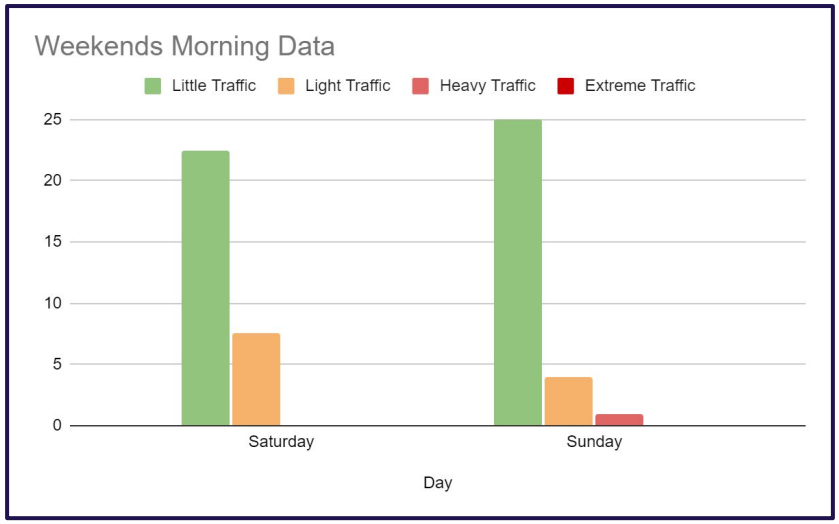
- The weighted average of Saturday & Sunday is 1.52 for both days in the morning.
- This determines the average traffic flow is light traffic on weekend mornings.

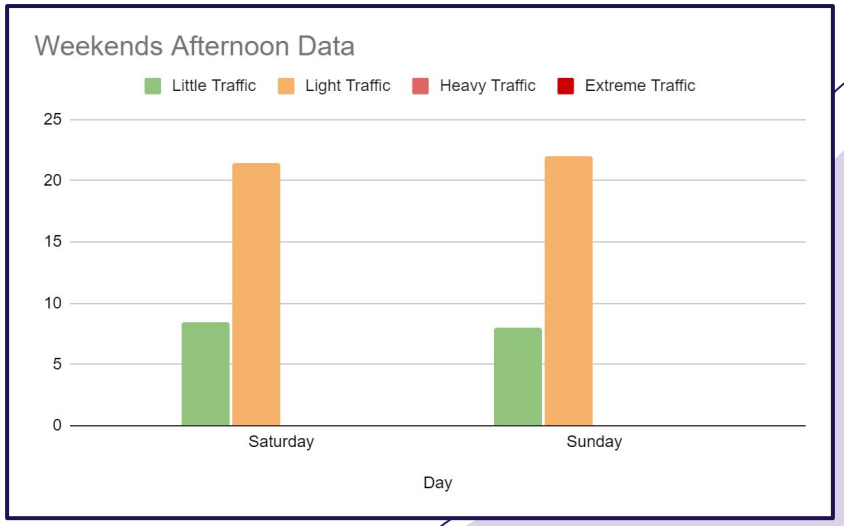
Between the hours of 3:00 PM to 7:00 PM...

- The weighted average of Saturday & Sunday is 1.83 for both days in the afternoon.
- This determines the average traffic flow is light traffic on weekend afternoons.

Bellingham Sq.

Weekend Traffic Flows



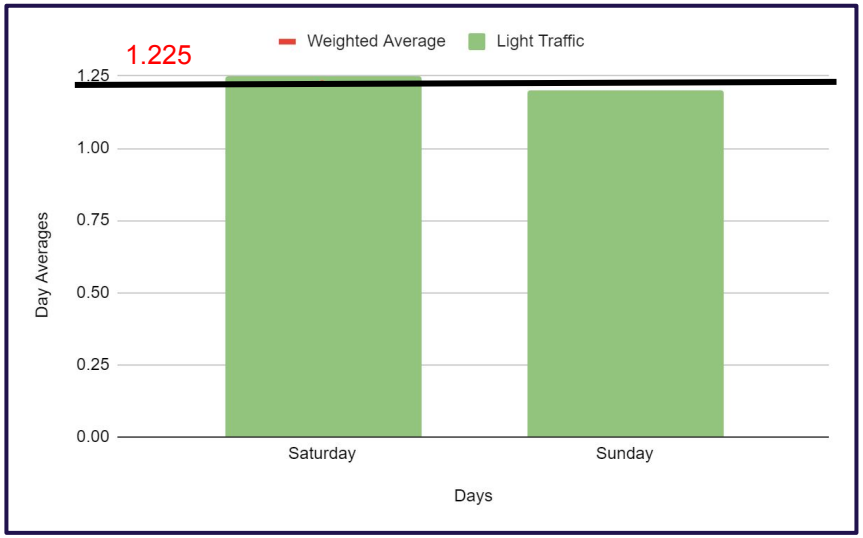


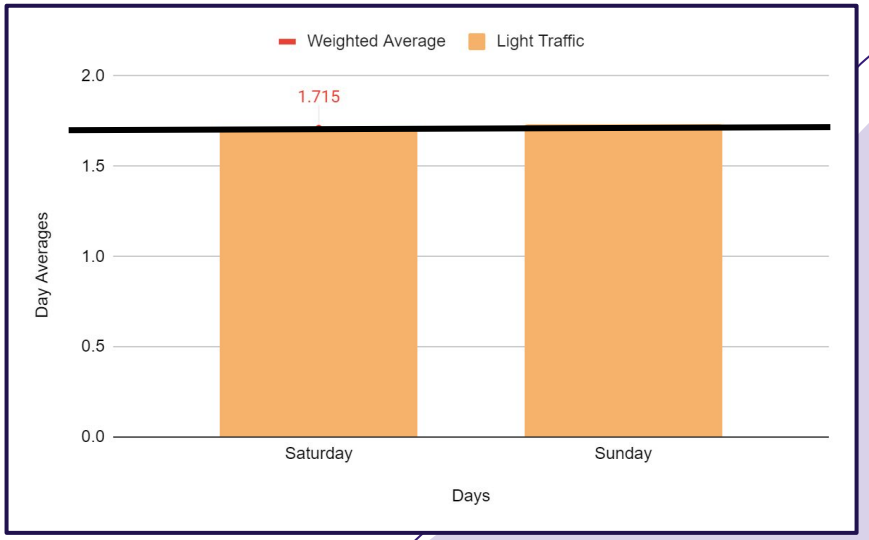
Between the hours of 6:00 AM to 10:00 AM...

- On Saturdays, there tends to be more little traffic, than light traffic on roads reported.
- On Sundays, there tends to be more light traffic than little traffic on roads, but a road experienced heavy traffic once reported.

Between the hours of 3:00 PM to 7:00 PM...

- On Saturdays, there tends to be more light traffic than little traffic on roads reported.
- On Sundays, there tends to be more light traffic than little traffic on roads reported.





Between the hours of 6:00 AM to 10:00 AM...

- The weighted average of Saturday & Sunday is 1.225 for both days in the morning.
- This determines the average traffic flow is little traffic on weekend mornings.

Between the hours of 3:00 PM to 7:00 PM...

- The weighted average of Saturday & Sunday is 1.715 for both days in the afternoon.
- This determines the average traffic flow is light traffic on weekend afternoons.

Data Conclusion

Overall, this data shows the trend of light traffic within Bellingham Square. This determines that the area doesn't have severe types of traffic, allowing a quick flow of traffic through the square. Our findings show that on average, Bellingham Square is busy but has rapid, swift flow of traffic, essential to Chelsea Residents and vehicle drivers.

Although this may be the case, construction and new advancements may disrupt these flows of traffic. This will cause slower traffic flow for the thousands of vehicles who drives through Bellingham Square.

Solution

It is essential for the new construction plans of Bellingham Square maintains the quicker flow of traffic this area already has. This location is considered one of the most important locations to get across the city, which these prosperities must be kept.

Buses

Buses are the #1 transportation in Chelsea. Read more about this at chelseama.gov/mbta-info

Slightly north of downtown Chelsea there is the **Bellingham Square Station.** This station is a platform for buses on the SL3 route.

Since this small area is so urbanized and populous there are a significant amount of cars that pass through.

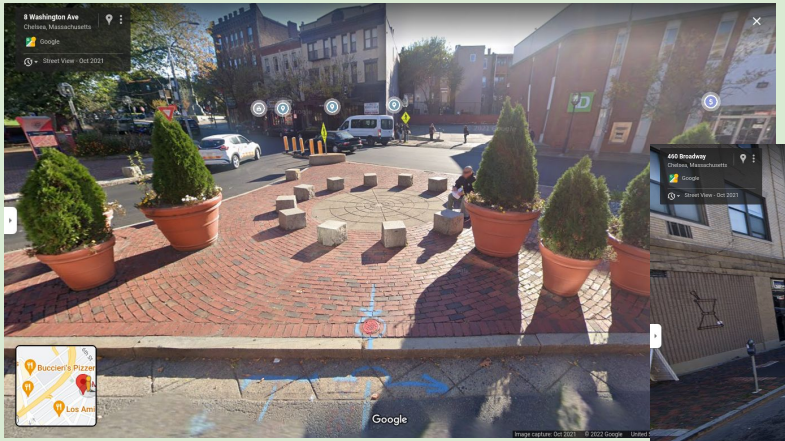
Bus Routes
Various bus stops around Bellingham Square serve as an easy and accessible way of transportation for the people of Chelsea. On Hawthorne St, the bus lines 116 (Wonderland), 117 (Wonderland), 114 (Market Basket), 111 (Cary Ave.), 111 (Woodlawn). On Broadway, the bus lines 116 (Maverick), 117 (Maverick), 114 (Market Basket), 112 (Wellington), 111 (Haymarket)

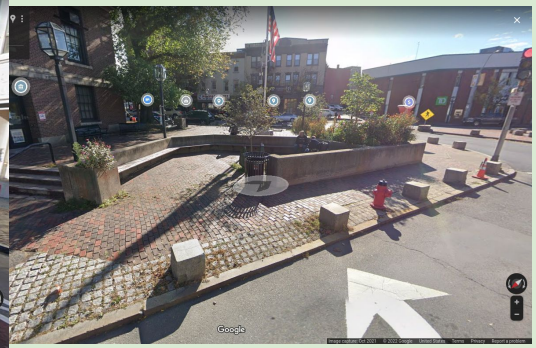
Environment and Safety

Aya, Kenia, and Justin

Environment (Landscape, Streets)

These pictures capture some of the areas in Bellingham Sq. that would benefit some green space. By adding more green space it reduces air pollution and noise reduction. It also provides a feeling of comfort and overall benefits for physical and mental health.What we've noticed is that what makes up for most of the streets in Bellingham Sq. are bricks. Instead of having bricks (which are not permeable), it would be a better option to add a permeable surface.





Safety

In these photos there’s supposed to be an intersection that was built in mind with the fire station being right near the area, but given how unclear the format is the majority of cars don’t follow the path which has caused many altercations between pedestrians and cars. There is also a lack of sidewalk bumps or push buttons at the majority of the crosswalks in Chelsea, and typically when there are lights available they go off at the wrong times/not in harmony with the traffic lights , which could easily lead to disaster. We believe it would be beneficial to install more lights catered towards pedestrians, make crossing areas more easily clear/visible, and we ask that perhaps some bi-monthly maintenance/”checking in” of crosswalk lights to ensure everything remains working properly

Safety in Sidewalks

The walking areas of Chelsea are not suitable for the citizens that reside here; most notably parents with children in baby carriages and disabled citizens. As we were taking a stroll down Chelsea, we tripped multiple times and stumbled upon bricks that were falling apart, potholes that were hidden from the average eye and uneven terrain, which is why we emphasize changing the material used to pave the sidewalks and using a flattening method like the three plate method.

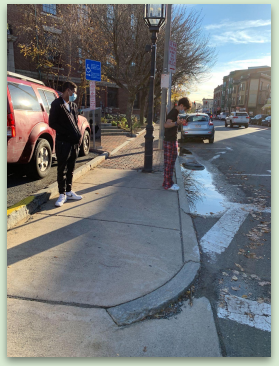
Accessibility (Crosswalks, Signals, Foot Traffic)

As it is built right now, Chelsea is not only non-friendly towards foot traffic in the forms of the way the sidewalks and crosswalks are built, but it is entirely inaccessible to people of all sectors of the disabled community. There is a lack of ramps for the considerable population we have in wheelchairs, the bricks in the road are jagged and make people prone to injury, and for many with intellectual disabilities the discord of the traffic and crossing lights can lead to disaster and hazardous situations.

Proposed Solutions

We need to reconstruct this area to be more even/flat surface like because it is hard even as an able bodied person to navigate through the area. Not only this, but the way these sidewalks and roads are constructed leads to an abundant amount of standing water-which essentially ferments until it has an unpleasant smell and is rather dirty, a safety hazard for the people around Chelsea.

I would suggest ramps and clear cut directional signs that allow disabled citizens to navigate through the city; and in the long run, using concrete instead of bricks on the majority of the surface so it is more convenient and inclusive. We can do this via the Whitworth Three Plates method- given that Chelsea and Massachusetts in general have a natural uneven terrain (and bricks). This would encourage people/make it far easier for them to take their grievances to city hall and be more active in the “center” of Chelsea and their community.



Continuation of Proposed Solutions

Like what was mentioned earlier, Chelsea is not a city that is friendly to foot traffic, and even with reforms it will most likely have a majority of its streets taken up by roads for cars. Through searching our group found bioethanol, a popular fuel that helps to enhance air quality by reducing pollutants while also improving vehicle performance. This is one of the fuels that is produced in a manner similar to that of brewing beer. Waste resources are used to create this type of fuel. It is classified as an environmentally friendly fuel because of this, and we believe that if we started incorporating this instead of gas stations dependent on, well, gas, this would also help relieve the air quality in Chelsea given that ours is one of the worst in Massachusetts. We know that for now, this may be a little far fetched, but we urge consideration in the future of this as we work towards a more green planet.